

§ 153.1608

46 CFR Ch. I (10-1-03 Edition)

(b) If multiple tests are made on a tank without modifications to the tank, pumping system, or stripping procedure between the tests, the stripping quantity must be taken as the average of the stripping quantities for all of the tests.

(c) If multiple tests are made on a tank with modifications to the tank, pumping system, or stripping procedure between the tests, the stripping quantity is the stripping quantity determined under paragraph (b) of this section using only those tests performed after the last modification.

§ 153.1608 Calculation of total NLS residue and clingage NLS residue.

(a) The total NLS residue for each tank is calculated by adding the stripping quantity and the clingage NLS residue.

(b) The clingage NLS residue for each tank is calculated using the following formula:

$$Q_{\text{clingage}} = 1.1 \times 10^{-4} A_d + 1.5 \times 10^{-5} A_w + 4.5 \times 10^{-4} L^{1/2} A_b$$

where:

A_b = Area of the tank bottom added to the area in square meters of tank structural components projected on a horizontal surface

A_d = Area of the tank underdecks added to the area in square meters of tank structural components projected on a horizontal surface

A_w = Area of the tank walls added to the area in square meters of tank structural components projected on a vertical surface

L = Length of tank in meters from fore to aft

Q_{clingage} = volume of clingage in cubic meters

When using the formula in this paragraph, areas that are inclined more than 30° from the horizontal may be assumed to be vertical.

NOTE: The Commandant (G-MSO) (tel num;202-267-1217) has information that may be useful in approximating surface areas of typical structural members for the projected area calculations under § 153.1608(b).

TABLE 1 TO PART 153—SUMMARY OF MINIMUM REQUIREMENTS

Cargo name	IMO Annex II Pollution Category	Haz.	Cargo containment system	Vent height	Vent	Gauge	Fire protection system	Special requirements in 46 CFR Part 153	Electrical hazard class and group
a.	b.	c.	d.	e.	f.	g.	h.	i.	j.
Acetic acid	D	S	III	4m	PV	Restr	A	.238(a), .409, .527, .554, .933	I-D
Acetic anhydride	D	S	II	4m	PV	Restr	A	.238(a), .409, .526, .527, .554, .933	I-D
Acetochlor	A	P	II	NR	Open	Open	A	.409	NA
Acetone cyanohydrin	A	S/P	II	B/3	PV	Closed	A	.238(a), .316, .336, .408, .525, .526, .527, .912(a)(2), .933, .1002, .1004, .1020, .1035	I-D
Acetonitrile	III	S	II	B/3	PV	Restr	A	.409, .525, .526, .1020	I-D
Acrylamide solution (50% or less)	D	S	II	NR	Open	Closed	NSR	.409, .525(a), (c), (d), (e), .912(a)(1), .1002(a), .1004, .1020	NA
Acrylic acid	D	S	III	4m	PV	Restr	A	.238(a), .409, .526, .912(a)(1), .933, .1002(a), .1004	I-D
Acrylonitrile	B	S/P	II	B/3	PV	Closed	A	.236(a), (c), (d), .316, .408, .525, .526, .527, .912(a)(1), .1004, .1020	I-D
Adiponitrile	D	S	III	4m	PV	Restr	A	.526	I-D
Alcohol	B	S/P	III	NR	Open	Open	A, C	.238(a), .409, .440, .468, .908(a), (b)	NA
Alcohol (C6-C17) (secondary) poly(3-6ethoxy)lates.	A	P	II	NR	Open	Open	A	.409	NA
Alcohol (C6-C17) (secondary) poly(7-12ethoxy)lates.	B	P	III	NR	Open	Open	A	.409, .440, .908(a), (b)	NA
Alcohol(C9-C11) poly(2.5-9) ethoxylate	B	P	III	NR	Open	Open	A	.409, .440, .908(a)	NA
Alcohol(C12-C15) poly(...ethoxy)lates, see Alcohol(C12-C16) poly(...ethoxy)lates.	B	P	III	NR	Open	Open	A	.409, .440, .908(a)	NA
Alcohol(C12-C16) poly(1-6ethoxy)lates	A	P	II	NR	Open	Open	A	.409	NA
Alcohol(C12-C16) poly(7-19)ethoxy)lates	B	P	III	NR	Open	Open	A	.409, .440, .908(a)	NA
Alcohol(C12-C16) poly(20+)ethoxy)lates	C	P	III	NR	Open	Open	A	None	NA
Alkanes(C6-C9) (all isomers)	C	P	III	4m	PV	Restr	A	.409	I-D
Alkane(C14-C17) sulfonic acid, sodium salt solution (65% or less).	B	P	III	NR	Open	Open	NSR	.440, .908(a)	NA
Alkaryl polyether (C9-C20)	B	P	III	NR	Open	Open	A, B	.409; (.440, .908(a)) ¹	NA
Alkenyl(C16-C20) succinic anhydride	D	S	III	B/3	PV	Closed	NSR	.316, .408, .525, .526, .1020	NA
Alkyl acrylate-Vinyl pyridine copolymer in Toluene.	C	P	III	4m	PV	Restr	A	.409	NA
Alkylary phosphate mixtures (more than 40% Diphenyl tolyl phosphate, less than 0.02% ortho-isomer).	A	S/P	I	B/3	PV	Closed	A, B, C	.316, .408, .525, .526, .1020	NA
Alkyl(C3-C4)benzenes (all isomers)	A	P	III	4m	PV	Restr	A	.409	I-D
Alkyl(C5-C8)benzenes (all isomers)	A	P	II	NR	Open	Open	A	.409	I-D
Alkybenzene, Alkylindane, Alkylindene mixture (each C12-C17).	A	P	II	NR	Open	Open	A	.409	NA
Alkylbenzenesulfonic acid (greater than 4%).	C	S/P	III	NR	Open	Open	A, B	.440, .908(a)	NA

Cargo name	IMO Annex II Pollution Category	Haz.	Cargo containment system	Vent height	Vent	Gauge	Fire protection system	Special requirements in 46 CFR Part 153	Electrical hazard class and group
a.	b.	c.	d.	e.	f.	g.	h.	i.	j.
Alkylbenzenesulfonic acid, sodium salt solution.	C	P	III	NR	Open	Open	NSR	.440, .903, .908(a), (b)	NA
Alkyl(C7-C9) nitrates	B	S/P	II	NR	Open	Open	A, B	.409, .560, .1002	NA
Alkyl (C7-C11) phenol poly(4-12) ethoxy/ate.	B	P	III	NR	Open	Open	A	.409, .440, .488, .908(a), (b)	I-D
Alkyl(C8-C9) phenylamine in aromatic solvent.	A	P	III	4m	PV	Restr	A	.409	NA
Alkyl(C10-C20, saturated and unsaturated) phosphite.	C	P	III	NR	Open	Open	A	None	NA
Alkyl(C8-C10) polyglucoside solution (65% or less).	C	P	III	NR	Open	Open	NSR	.440, .908(a), (b)	NA
Alkyl(C12-C14) polyglucoside solution (55% or less).	B	P	III	NR	Open	Open	NSR	.409, .440, .908(a), (b)	NA
Alkyl(C8-C10)/(C12-C14): (40% or less/ 60% or more) polyglucoside solution (55% or less).	B	P	III	NR	Open	Open	NSR	.409, .440, .908(a), (b)	NA
Alkyl(C8-C10)/(C12-C14): (50/50%) polyglucoside solution (55% or less).	C	P	III	NR	Open	Open	NSR	.440, .908(a), (b)	NA
Alkyl(C8-C10)/(C12-C14): (60% or more/ 40% or less) polyglucoside solution (55% or less).	C	P	III	NR	Open	Open	NSR	.440, .908(a), (b)	NA
Allyl alcohol	B	S/P	II	B/3	PV	Closed	A	.316, .408, .525, .526, .527, .933, .1020	I-C
Allyl chloride	B	S/P	II	B/3	PV	Closed	A	.316, .408, .525, .526, .527, .1020	I-D
Aluminum chloride (30% or less), Hydrochloric acid (20% or less) solution.	D	S	III	4m	PV	Restr	NSR	.252, .526, .527, .554, .557, .933, .1045, .1052	I-B
2-(2-Aminoethoxy) ethanol	D	S	III	NR	Open	Open	A, C, D	.236(b), (c), .409	NA
Aminoethylthiouamine	D	S	III	NR	Open	Open	A	.236(a), (b), (c), (g)	NA
N-Aminoethylpiperazine	D	S	III	4m	PV	Restr	A	.236(b), (c), .409, .526	I-C
2-Amino-2-methyl-1-propanol (90% or less).	D	S	III	NR	Open	Open	A	.236(a), (b), (c), (g)	I-D
Ammonia aqueous (28% or less), see Ammonium hydroxide (28% or less NH ₃).									
Ammonium bisulfite solution (70% or less)	D	S	III	4m	PV	Restr	No	.238(e), .526, .933, .1002	NA
Ammonium hydroxide (28% or less NH ₃)	C	S/P	III	4m	PV	Restr	A, B, C	.236(b), (c), (f), .526, .527	I-D
Ammonium nitrate solution (greater than 45% and less than 93%).	D	S	II	NR	Open	Open	NSR	.238(d), .252, .336, .409, .554(a), (b)	NA
Ammonium sulfide solution (45% or less)	B	S/P	II	B/3	PV	Closed	A, C	.236(a), (b), (c), (g), .316, .408, .525, .526, .527, .933, .1002, .1020	I-D
Ammonium thiocyanate (25% or less), Ammonium thiosulfate (20% or less) solution.	C	P	III	NR	Open	Open	NSR	None	NA

	C	P	III	NR	Open	Open	NSR		NA
Ammonium thiosulfate solution (60% or less)	C	P	III	4m	Open	Open		.440, .908(b)	NA
Amyl acetate (all isomers)	C	P	III	4m	PV	Restr	A	.409	I-D
tert-Amyl methyl ether	C	P	III	4m	PV	Restr	A	.409	NA
Aniline	C	S/P	II	B/3	PV	Closed	A	.316, .408, .525, .526, .933, .1020	I-D
Anthracene oil (Coal tar fraction), see Coal tar.									
Aviation alkylates	C	P	III	4m	PV	Restr	B	.409	I-C
(C8 paraffins and iso-paraffins, b. pt. 95–120 deg. C).									
Barium long chain (C11–C50) alkaryl sulfonate.	B	S/P	II	NR	Open	Open	A, D	.408, .440, .525(a), (c), (e), (d), .908(a), .1020	NA
Barium long chain alkyl (C8–C14) phenate sulfide.	[A]	P	II	NR	Open	Open	A	.409	NA
Benzene hydrocarbon mixtures ² (having 10% Benzene or more).	C ²	S/P	III	B/3	PV	Closed	A, B	.316, .409, .440, .526, .908(b), .933, .1060	I-D
Benzene sulfonyl chloride	D	S	III	4m	PV	Restr	A, B, D	.236(a), (b), (c), (g), .409, .526	I-D
Benzene, Toluene, Xylene mixtures ² (having 10% Benzene or more).	@C ²	S/P	III	B/3	PV	Closed	B	.316, .409, .440, .526, .908(b), .1060	I-D
Benzyl acetate	C	P	III	NR	Open	Open	A	None	I-D
Benzyl alcohol	C	P	III	NR	Open	Open	A	None	I-D
Benzyl chloride	B	S/P	II	B/3	PV	Closed	A, B	.316, .408, .525, .526, .527, .912(a)(2), .1004, .1020	I-D
Bromochloromethane	D	S	III	4m	PV	Restr	NSR	.236(a), (b), (d), .526, .933	NA
Butene oligomer	B	P	III	NR	Open	Open	A	.409	NA
Butyl acetate (all isomers)	C	P	III	4m	PV	Restr	A	.409	I-D
Butyl acrylate (all isomers)	B	S/P	II	4m	PV	Restr	A	.409, .526, .912(a)(1), .1002(a), (b), .1004	I-D
Butylamine (all isomers)	C	S/P	II	B/3	PV	Restr	A	.236(b), (c), .316, .408, .525, .526, .527, .1020	I-D
Butylbenzene (all isomers), see Alkyl(C3–C4)benzenes (all isomers).	A	P	III	4m	PV	Restr	A	.409	I-D
Butyl benzyl phthalate	A	P	II	NR	Open	Open	A	.409	I-D
n-Butyl butyrate, see Butyl butyrate (all isomers).									
Butyl butyrate (all isomers)	B	P	III	4m	PV	Restr	A	.409	I-D
1,2-Butylene oxide	C	S/P	III	4m	PV	Restr	A, C	.372, .409, .440, .500, .526, .530(a), (c), (e)–(g), (m)–(o), .1010, .1011	I-B
n-Butyl ether	C	S/P	III	B/3	PV	Restr	A, D	.409, .500, .525, .526, .1020	I-C
Butyl heptyl ketone	[C]	P	III	NR	Open	Open	A	None	NA
iso-Butyl isobutyrate, see Butyl butyrate (all isomers)									
Butyl methacrylate	D	S	III	4m	PV	Restr	A, D	.409, .526, .912(a)(1), .1002(a), (b), .1004	I-D
Butyl methacrylate, Decyl methacrylate, Cetyl-Eicosyl methacrylate mixture.	D	S	III	4m	PV	Restr	A, C, D	.912(a)(1), .1002(a), (b), .1004	I-D
n-Butyl propionate	C	P	III	4m	PV	Restr	A	.409	I-D
Butyl toluene	@A	S/P	III	NR	Open	Open	A	.409	I-D
Butyraldehyde (all isomers)	C	S/P	III	4m	PV	Restr	A	.409, .526	I-C
Butyric acid	D	S	III	4m	PV	Restr	A	.238(a), .554	I-D
Calcium alkyl(C9)phenol sulfide, polyolefin phosphorosulfide mixture.	A	P	II	NR	Open	Open	A, B	.409	NA
Calcium bromide, Zinc bromide solution, see Drilling brine (containing Zinc salts).									

Cargo name	IMO Annex II Pollution Category	Haz.	Cargo containment system	Vent height	Vent	Gauge	Fire protection system	Special requirements in 46 CFR Part 153	Electrical hazard class and group
a.	b.	c.	d.	e.	f.	g.	h.	i.	j.
Calcium hypochlorite solution (15% or less).	C	S/P	III	4m	PV	Restr	NSR	.236(a), (b)	NA
Calcium hypochlorite solution (more than 15%).	B	S/P	III	4m	PV	Restr	NSR	.236(a), (b), .409	NA
Calcium long chain alkyl(C5-C10) phenate.	C	P	III	NR	Open	Open	A	None	NA
Calcium long chain alkyl salicylate (C13+)	C	P	III	NR	Open	Open	A, B	(.440, .903, .908(a)) ¹	NA
Camphor oil	B	S/P	II	4m	PV	Restr	A, B	.409	I-D
Carbolic oil	A	S/P	II	B/3	PV	Closed	A	.408, .440, .525, .526, .908(b), .933, .1020	NA
Carbon disulfide	B	S/P	II	B/3	PV	Closed	C	.236(c), .252, .408, .500, .515, .520, .525, .526, .527, .1020, .1040.	I-A
Carbon tetrachloride	B	S/P	III	B/3	PV	Closed	NSR	.316, .409, .525, .526, .527, .1020	NA
Cashew nut shell oil (untreated)	D	S	III	4m	PV	Restr	A, B	.526, .933	NA
Caustic potash solution	C	S/P	III	NR	Open	Open	NSR	.236(a), (c), (g), .933	NA
Caustic soda solution	D	S	III	NR	Open	Open	NSR	.236(a), (c), (g), .933	NA
Cetyl-Eicosyl methacrylate mixture	III	S	III	NR	Open	Open	A, C, D	.912(a)(1), .1002(a), (b), .1004	NA
Chlorinated paraffins (C10-C13)	A	P	I	NR	Open	Open	A	.408	NA
Chloroacetic acid (80% or less)	C	S/P	III	B/3	PV	Closed	NSR	.238(e), .408, .440, .554, .908(b)	I-D
Chlorobenzene	B	S/P	III	4m	PV	Restr	A, B	.409, .526	I-D
Chloroform	B	S/P	III	B/3	PV	Restr	A, B	.409, .525, .526, .527, .1020	I-D
(<i>crude</i>) Chlorohydrins	D	S	II	B/3	PV	Closed	A	.408, .525, .526, .1020	I-D
4-Chloro-2-methylphenoxycetic acid, dimethylamine salt solution.	C	P	III	NR	Open	Open	NSR	.236(a), (b), (c), (g)	NA
o-Chloronitrobenzene	B	S/P	II	B/3	PV	Closed	A, B, C, D	.316, .336, .408, .440, .525, .526, .908(a), (b), .933, .1020.	NA
1-(4-Chlorophenyl)-4-dimethyl pentan-3-one.	B	P	III	NR	Open	Open	A, B, D	.409, .440, .488, .908(a), (b)	NA
2- or 3-Chloropropionic acid	C	S/P	III	NR	Open	Open	A	.238(a), (b), .440, .554, .908(a), (b)	NA
Chlorosulfonic acid	C	S/P	I	B/3	PV	Closed	NSR	.408, .525, .526, .527, .554, .555, .602, .933, .1000, .1020, .1045.	I-B
o-Chlorotoluene	A	S/P	III	4m	PV	Restr	A, B, C	.409, .526	I-D
m-Chlorotoluene	B	S/P	III	4m	PV	Restr	A, B, C	.409, .526	I-D
p-Chlorotoluene	B	S/P	II	4m	PV	Restr	A, B, C	.409, .440, .526, .908(b)	I-D
Chlorotoluenes (mixed isomers)	A	S/P	II	4m	PV	Restr	A, B, C	.409, .526	I-D
Coal tar	A	S/P	II	4m	PV	Restr	B, D	.409, .933, .1060	I-D
Coal tar naphtha solvent	B	S/P	III	4m	PV	Restr	A, D	.409, .526, .933, .1060	I-D
Coal tar pitch (molten)	D	S	III	4m	PV	Restr	B, D	.252, .409, .933, .1060	I-D
Cobalt naphthenate in solvent naphtha	A	S/P	II	4m	PV	Restr	A, D	.409, .526	I-D
Coconut oil, fatty acid	C	P	III	NR	Open	Open	A	.440, .903, .908(a), (d)	NA
Cottonseed oil, fatty acid	[C]	P	III	NR	Open	Open	A	.440, .903, .908(a)	NA
Creosote (coal tar)	A	S/P	II	NR	Open	Open	A, B, D	.409	I-D
Creosote (wood)	A	S/P	II	NR	Open	Open	A, B, D	.409	NA

Chemical Name	A	S/P	II	NR	Open	Open	A, B	Regulatory Codes	I-D
Cresols (all isomers)							A, B	.409, .440, .908(b)	I-D
Cresols with less than 5% Phenol, see Cresols (all isomers)									
Cresols with 5% or more Phenol, see Phenol									
Cresylate spent caustic (mixtures of Cresols and Caustic soda solutions)	A	S/P	II	NR	Open	Open	NSR	.236(a), (c), .409, .933	NA
Cresylic acid, dephenolized	A	S/P	II	NR	Open	Open	A, B	.409	NA
Cresylic acid, sodium salt solution, see Cresylate spent caustic.									
Crotonaldehyde	A	S/P	II	B/3	Restr	PV	A	.316, .409, .525, .526, .527, .1020	I-C
Cumene (isopropylbenzene), see Propylbenzene (all isomers).									
1,5-Cyclododecatriene	A	S/P	I	4m	Restr	PV	A	.236(b), (c), .408, .526, .912(a)(1), .1002(a), (b), .1004	I-D
Cycloheptane	C	P	III	4m	Restr	PV	A	.409	I-D
Cyclohexane	C	P	III	4m	Restr	PV	A	.409, .440, .908(b)	I-D
Cyclohexanone	D	S	III	4m	Restr	PV	A	.236(a), (b), .409, .526	I-D
Cyclohexanone, Cyclohexanol mixture	D	S	III	4m	Restr	PV	A	.236(a), (b), .526	I-D
Cyclohexyl acetate	B	P	III	4m	Restr	PV	A	.409	I-D
Cyclohexylamine	C	S/P	III	4m	Restr	PV	A, C, D	.236(a), (b), (c), (g), .409, .526	I-D
1,3-Cyclopentadiene dimer (molten)	B	P	II	4m	Restr	PV	A	.409, .440, .488, .908(a), (b)	I-C
Cyclopentane	C	P	III	4m	Restr	PV	A	.409	I-D
Cyclopentene	B	P	III	4m	Restr	PV	A	.409	I-D
p-Cymene	C	P	III	4m	Restr	PV	A	.409	I-D
iso-Decaldehyde	@C	P	III	NR	Open	Open	A	None	I-C
n-Decaldehyde	@B	P	III	NR	Open	Open	A	None	I-C
Decanoic acid	C	P	III	NR	Open	Open	A	.440, .903, .908(a), (b)	NA
Decene	C	P	III	4m	Restr	PV	A	.409	I-D
Decyl acetate	B	P	III	NR	Open	Open	A	.409	NA
(iso-, n-) Decyl acrylate	A	S/P	II	NR	Open	Open	A, C, D	.236(a), (b), (c), .409, .912(a)(1), .1002(a), (b), .1004	I-D
Decyl alcohol (all isomers)	B	P	III	NR	Open	Open	A	.409, .440, .908(b)	I-D
Decyloxytetrahydro-thiophene dioxide	A	S/P	II	B/3	Restr	PV	NSR	.409, .526	NA
Dibromomethane	C	S/P	II	4m	Restr	PV	NSR	.236(a), (b), (d), .408, .525(a), (c), (d), (e), .526, .933, .1020	NA
Dibutylamine	C	S/P	III	4m	Restr	PV	A, B, C, D	.236(b), (c), .409, .526	I-C
Dibutyl hydrogen phosphonate	B	P	III	NR	Open	Open	A	.409, .440, .908(a)	NA
ortho-Dibutyl phthalate	A	P	II	NR	Open	Open	A	.409	I-D
Dichlorobenzene (all isomers) 1	B	S/P	II	4m	Restr	PV	A, B, D	.236(a), (b), .409, .440, .488 ¹ , .526, .908(a), (b) ¹	I-D
3,4-Dichloro-1-butene	B	S/P	III	B/3	Closed		A, B, C	.316, .409, .525(a), (c), (d), (e), .526, .527, .933, .1020	I-D
1,1-Dichloroethane	D	S	III	4m	Restr	PV	A, B	.409, .526, .527	I-D
2,2-Dichloroethyl ether	B	S/P	II	4m	Restr	PV	A	.236(a), (b), .409, .526	I-C
1,6-Dichlorohexane	B	S/P	II	4m	Restr	PV	A, B	.409, .526	NA
2,2'-Dichloroisopropyl ether	C	S/P	II	B/3	Restr	PV	A, B, C, D	.236(a), (b), .316, .408(a), .440, .525, .526, .1020	I-D
Dichloromethane	D	S	III	4m	Restr	PV	NSR	.526	I-D
2,4-Dichlorophenol 4	A	S/P	II	4m	Restr	PV	A, B, C, D	.236(a), (b), (c), (g), .409, .440, .500, .501, .526, .908(b), .933	I-D
2,4-Dichlorophenoxyacetic acid, diethanolamine salt solution.	A	S/P	III	NR	Open	Open	NSR	.236(a), (b), (c), (g), .409	NA

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a.	b.	c.	d.	e.	f.	g.	h.	i.	j.
2,4-Dichlorophenoxyacetic acid, dimethylamine salt solution.	A	S/P	III	NR	Open	Open	NSR	.236(a), (b), (c), (g), .409	NA
2,4-Dichlorophenoxyacetic acid, isopropanolamine salt solution.	A	S/P	III	NR	Open	Open	NSR	.236(a), (b), (c), (g), .409	NA
1,1-Dichloropropane	C	S/P	II	B/3	PV	Restr	A, B	.409, .525, .526, .1020	I-D
1,2-Dichloropropane	C	S/P	II	B/3	PV	Restr	A, B	.409, .525, .526, .1020	I-D
1,3-Dichloropropane	D	S	II	B/3	PV	Restr	A, B	.409, .525, .526, .1020	I-D
1,3-Dichloropropane	B	S/P	II	B/3	PV	Closed	A, B, C, D	.316, .336, .408, .525, .526, .527, .1020	I-D
Dichloropropane, Dichloropropane mixtures.	B	S/P	II	B/3	PV	Closed	A, B, C, D	.316, .336, .408, .525, .526, .527	I-D
2,2-Dichloropropionic acid	D	S	III	4m	PV	Restr	A	.238(e), .266, .500, .501, .554, .933	NA
Diethanolamine	D	S	III	NR	Open	Open	A	.236(b), (c)	NA
Diethylamine	C	S/P	III	B/3	PV	Restr	A	.236(a), (b), (c), (g), .409, .525, .526, .527, .1020	I-C
Diethylaminoethanol, see Diethylethanolamine									
Diethylethanolamine	C	S/P	III	NR	Open	Open	B, C, D	.236(b), .409, .440, .908(b)	NA
2,6-Diethylaniline	A	P	III	4m	PV	Restr	A	.409	I-D
Diethylenetriamine	D	S	III	NR	Open	Open	A	.236(b), (c)	NA
Diethylethanolamine	C	S/P	III	4m	PV	Restr	A, C	.236(a), (b), (c), (g), .409, .526	I-C
Diethyl ether, see Ethyl ether									
Di-(2-ethylhexyl) phosphoric acid	C	S/P	III	NR	Open	Open	A, B, C, D	.236(b), (c)	I-D
Diethyl phthalate	C	P	III	NR	Open	Open	A	None	I-D
Diethyl sulfate	B	S/P	II	4m	PV	Closed	A, D	.236(a), (c), (d), .409, .526, .933	I-D
Diglycidyl ether of Bisphenol A	B	P	III	NR	Open	Open	A	.409, .440, .908(e)	NA
Diglycidyl ether of Bisphenol F	B	P	III	NR	Open	Open	A	.409, .440, .908(e)	NA
Di-n-hexyl adipate	B	S/P	III	NR	Open	Open	A, B, C, D	.409	NA
Diisobutylamine	C	S/P	II	4m	PV	Restr	A, B, C, D	.236(a), (b), (c), (g), .409, .525(a), (c), (d), (e), .526, .1020	I-C
Diisobutylcarbinol	@C	P	III	NR	Open	Open	A	None	I-D
Diisobutylene	B	P	III	4m	PV	Restr	A	.409	I-D
Diisobutyl phthalate	B	P	III	NR	Open	Open	A	.409, .440, .908(e)	I-D
Diisopropanolamine	C	S/P	III	NR	Open	Open	A	.236(b), (c), .440, .908(e), (b)	I-D
Diisopropylamine	C	S/P	III	B/3	PV	Closed	A	.236(b), (c), .408, .525, .526, .527, .1020	I-D
Diisopropylbenzene (all isomers)	A	P	II	NR	Open	Open	A	.409	I-D
N,N-Dimethylacetamide	D	S	III	B/3	PV	Restr	B	.236(b), .316, .525, .526, .527, .1020	I-D
N,N-Dimethylacetamide solution (40% or less).	D	S	III	B/3	PV	Restr	B	.236(b), .316, .526	I-D
Dimethyl adipate	B	P	III	NR	Open	Open	A	.409, .440, .908(b)	NA
Dimethylamine solution (45% or less)	C	S/P	III	B/3	PV	Restr	A, C, D	.236(a), (b), (c), (g), .409, .525, .526, .527, .1020	I-C
Dimethylamine solution (over 45% but not over 55%).	C	S/P	II	B/3	PV	Closed	A, C, D	.236(a), (b), (c), (g), .316, .408, .525, .526, .527, .1020	I-C

Chemical Name	C	S/P	II	B/3	PV	Closed	A, C, D	236(a), (b), (c), (g), .316, .372, .408, .525, .526, .527, .1020	I-C
Dimethylamine solution (over 55% but not over 65%)	[C]	S/P	III	NR	Open	Open	A, C, D	.236(a), (b), (c), (g), .316, .372, .408, .525, .526, .527, .1020	I-C
2,6-Dimethylaniline	A	S/P	III	NR	Open	Open	B, C, D	.236(b), .409, .440, .908(b)	I-D
N,N-Dimethylchloroethylamine	A	S/P	II	B/3	PV	Restr	A, C	.236(a), (b), (c), (g), .316, .409, .525, .526, .527, .1020	NA
N,N-Dimethyldodecylamine	C	S/P	I	NR	Open	Open	B	.236(b), .408	NA
Dimethylethanolamine	D	S	III	4m	PV	Restr	A, D	.236(b), (c), .409, .526	I-C
Dimethylformamide	D	S	III	4m	PV	Restr	A, D	.236(b), .409, .526	I-D
Dimethyl glutarate	C	P	III	NR	Open	Open	A	None	NA
Dimethyl hydrogen phosphite	B	S/P	III	4m	PV	Restr	A, D	.526	NA
Dimethyl naphthalene sulfonic acid, sodium salt solution.	[A]	P	III	NR	Open	Open	NSR	.409	NA
Dimethyloctanoic acid	C	P	III	NR	Open	Open	A	.440, .903, .908(b)	I-D
Dimethyl phthalate	C	P	III	NR	Open	Open	A	None	I-D
Dimethyl succinate	C	P	III	NR	Open	Open	A	.440, .908(b)	NA
Dinitrotoluene (molten)	A	S/P	II	B/3	PV	Closed	A	.316, .408, .525, .526, .527, .1003, .1020	I-C
1,4-Dioxane	D	S	II	B/3	PV	Closed	A	.408, .525, .526, .1020	I-C
Dipentene	C	P	III	4m	PV	Restr	A	.409	I-D
Diphenyl	A	P	I	NR	Open	Open	B	.408	I-D
Diphenylamine (molten)	B	P	III	NR	Open	Open	B, D	.236(b), .409, .440, .488, .908(b)	NA
Diphenylamines, alkylated	A	P	II	NR	Open	Open	A	.409	NA
Diphenylamine, reaction product with 2,2,4-Trimethylpentane.	A	S/P	I	NR	Open	Open	A	.408	NA
Diphenyl, Diphenyl ether mixtures	A	P	I	NR	Open	Open	B	.408	I-D
Diphenyl ether	A	P	III	NR	Open	Open	A	.409	I-D
Diphenyl ether, Biphenyl phenyl ether mixture.	A	P	III	NR	Open	Open	A, B	.409	NA
Diphenylmethane diisocyanate ⁶	B	S/P	II	B/3	PV	Closed	A, B, C ⁶ , D	.236(a), (b), .316, .409, .440, .500, .501, .525, .526, .602, .908(a), .1000, .1020	NA
Diphenylol propane-epichlorohydrin resins	B	P	III	NR	Open	Open	A, B	.409, .440, .908(a)	NA
Di-n-propylamine	C	S/P	III	4m	PV	Restr	A	.236(b), (c), .409, .525, .526, .1020	I-C
Dithiocarbamate ester (C7-C35)	A	P	II	NR	Open	Open	A, D	.409	NA
Dodecanol	B	P	III	NR	Open	Open	A	.409, .440, .488, .908(a), (b)	I-D
Dodecene (all isomers)	B	P	III	NR	Open	Open	A	.409	I-D
Dodecyl alcohol, see Dodecanol.									
Dodecylamine, Tetradecylamine mixture	A	S/P	II	4m	PV	Restr	A, D	.236(b), (c), .409, .526	NA
Dodecyldimethylamine,	A	S/P	II	NR	Open	Open	B, C, D	.236(b), .409	NA
Tetradecyldimethylamine mixture.									
Dodecyl diphenyl ether disulfonate solution.	A	S/P	II	NR	Open	Open	NSR	.409	NA
Dodecyl hydroxypropyl sulfide	A	P	I	NR	Open	Open	A	.408	NA
Dodecyl methacrylate	III	S	III	NR	Open	Open	A, C	.236(b), (c), .912(a)(1), .1004	I-D
Dodecyl-Octadecyl methacrylate mixture	D	S	III	NR	Open	Restr	A, D	.236(b), .912(a)(1), .1002(a), (b), .1004	NA
Dodecyl-Pentadecyl methacrylate mixture	III	S	III	NR	Open	Open	A, C, D	.912(a)(1), .1002(a), (b), .1004	NA
Dodecyl phenol	I	S	III	NR	Open	Open	A	.408	I-D
Drilling brine (containing Zinc salts)	B	P	III	NR	Open	Open	NSR	.409	NA
Epichlorohydrin	A	S/P	II	B/3	PV	Closed	A	.316, .408, .525, .526, .527, .1020	I-C
Ethanolamine	D	S	III	NR	Open	Open	A	.236(b), (c), .526	I-D
2-Ethoxyethyl acetate	C	P	III	4m	PV	Restr	A	.409	I-C
Ethyl acrylate	A	S/P	II	4m	PV	Restr	A	.409, .526, .527, .912(a)(1), .1002(a), (b), .1004	I-D
Ethylamine	C	S/P	II	B/3	PV	Closed	C, D	.236(b), (c), .252, .372, .409, .525, .526, .527, .1020 ...	I-D

Cargo name	IMO Annex II Pollution Category	Haz.	Cargo containment system	Vent height	Vent	Gauge	Fire protection system	Special requirements in 46 CFR Part 153	Electrical hazard class and group
a.	b.	c.	d.	e.	f.	g.	h.	i.	j.
Ethylamine solution (72% or less)	C	S/P	II	B/3	PV	Closed	A, C	.236(a), (b), (c), (g), .372, .408, .525(a), (c), (d), (e), .526, .527, .1020.	I-D
Ethyl amyl ketone	C	P	III	4m	PV	Restr	A	.409	I-D
Ethylbenzene	B	P	III	4m	PV	Restr	A	.236(a), (b), (c), (g), .409, .525(a), (c), (d), (e), .526, .1020.	I-D
N-Ethylbutylamine	C	S/P	III	4m	PV	Restr	A	.409	I-C
Ethyl tert-butyl ether	C	P	III	4m	PV	Restr	A	.409	I-C
Ethyl butyrate	C	P	III	4m	PV	Restr	A	.409	I-D
Ethylcyclohexane	C	P	III	4m	PV	Restr	A	.409	I-D
N-Ethylcyclohexylamine	D	S	III	4m	PV	Restr	A, C	.236(a), (b), (c), (g), .409, .526	I-C
S-Ethyl dipropylthiocarbamate	C	P	III	NR	Open	Open	A	None	NA
Ethylene chlorohydrin	C	S/P	II	B/3	PV	Closed	A, D	.316, .408, .525, .526, .527, .933, .1020	I-D
Ethylene cyanohydrin	D	S	III	NR	Open	Open	A	None	NA
Ethylendiamine	C	S/P	II	4m	PV	Restr	A	.236(b), (c), .409, .440, .526, .908(b)	I-D
Ethylene dichloride	B	S/P	II	B/3	PV	Closed	NSR	.408, .440, .525, .526, .527, .908(b), .1020	NA
Ethylene glycol butyl ether acetate	B	S/P	II	4m	PV	Restr	A, B	.236(b), .408, .526	I-D
Ethylene glycol diacetate	C	P	III	NR	Open	Open	A	None	I-C
Ethylene glycol ether acetate, see 2-Ethoxyethyl acetate	C	P	III	NR	Open	Open	A	None	I-D
Ethoxyethyl acetate	C	P	III	NR	Open	Open	A	None	I-C
Ethylene glycol methyl ether acetate	C	P	III	NR	Open	Open	A	None	I-C
Ethylene glycol monoalkyl ether	D	S	III	4m	PV	Restr	A	.409	I-C
Including: 2-Ethoxyethanol Ethylene glycol butyl ether Ethylene glycol tert-butyl ether Ethylene glycol ethyl ether Ethylene glycol hexyl ether Ethylene glycol methyl ether Ethylene glycol n-propyl ether Ethylene glycol isopropyl ether									
Ethylene oxide (30% or less), Propylene oxide mixture.	C	S/P	II	B/3	PV	Closed	A, C	.252, .372, .408, .440, .500, .525, .526, .530, .1010, .1011, .1020.	I-B
Ethyl ether	III	S	II	4m	PV	Closed	A	.236(g), .252, .372, .408, .440, .500, .515, .526, .527	I-C
Ethyl-3-ethoxypropionate	C	P	III	4m	PV	Restr	A	.409	NA
2-Ethylhexanol	@C	P	III	NR	Open	Open	A	None	I-D
2-Ethylhexyl acrylate	B	S/P	III	NR	Open	Open	A	.409, .912(a)(1), .1002(a), (b), .1004	I-D
2-Ethylhexylamine	B	S/P	II	B/3	PV	Restr	A	.236(b), (c), .409, .525, .526, .1020	I-D
Ethyl hexyl phthalate	C	P	III	NR	Open	Open	A, B, C, D	None	NA
Ethylidene norbornene	B	S/P	III	B/3	PV	Restr	A, B, C, D	.236(b), .409, .526	NA
Ethyl methacrylate	D	S	III	4m	PV	Restr	A, B, D	.409, .526, .912(a)(1), .1002(a), (b), .1004	I-D

Ethylphenol	A	S/P	III	NR	Open	Open	B	.409	I-D
2-Ethyl-3-propylacrolein	A	S/P	III	4m	PV	Restr	A	.409, .526	I-C
Ethyl toluene	B	P	III	4m	PV	Restr	A	.409	I-D
Ferric chloride solutions	C	S/P	III	NR	Open	Open	NSR	.409, .440, .554, .555, .908(b), .1045	I-B
Ferric nitrate, Nitric acid solution	C	S/P	II	4m	PV	Restr	NSR	.408, .526, .527, .554, .555, .559, .933, .1045	I-B
Fluorosilicic acid (30% or less)	C	S/P	III	B/3	PV	Restr	NSR	.252, .526, .527, .554, .555, .933, .1045	I-B
Formaldehyde (50% or more), Methanol mixtures.	#	S/P	III	4m	PV	Closed	A	.409, .526, .527	I-B
Formaldehyde solution (37% to 50%)	C	S/P	III	4m	PV	Restr	A	.409, .440, .526, .527, .908(b)	I-B
Formic acid	D	S	III	4m	PV	Restr	A	.238(b), (c), .409, .526, .527, .554, .933	I-D
Fumaric adduct of rosin, water dispersion	B	P	III	NR	Open	Open	NSR	.409, .440, .908(a)	NA
Furfural	C	S/P	III	4m	PV	Restr	A	.409, .526	I-C
Furfuryl alcohol	C	P	III	NR	Open	Open	A	None	I-C
Glutaraldehyde solution (50% or less)	D	S	III	NR	Open	Open	NSR	None	NA
Glycidyl ester of C10 Trialkyl acetic acid, see Glycidyl ester of Tridecyl acetic acid.	B	P	III	NR	Open	Open	A	.409	NA
Glycidyl ester of Tridecyl acetic acid	D	S	III	NR	Open	Open	A, C, D	.238(e), .554(a), (b), (c), .933, .1002	NA
Glyoxylic acid solution (50% or less)	C	P	III	4m	PV	Restr	A	.409	I-D
Heptane (all isomers), see Alkanes(C6-C9) (all isomers).	C	P	III	4m	PV	Restr	A	.409	I-D
Heptanol (all isomers)	C	P	III	4m	PV	Restr	A	.409	I-D
Heptene (all isomers)	C	P	III	4m	PV	Restr	A	.409	I-D
Heptyl acetate	B	P	III	NR	Open	Open	A	.409	I-D
Hexamethylenediamine (molten)	C	S/P	II	B/3	PV	Closed	C	.236(a), (b), (c), (g), .316, .336, .409, .440, .525, .526, .527, .908(a), (b), .933, .1020	NA
Hexamethylenediamine solution	C	S/P	III	4m	PV	Restr	A	.236(b), (c), .409, .440, .526, .908(b)	I-D
Hexamethylene diisocyanate ^e	B	S/P	II	B/3	PV	Closed	A, C ^e , D	.238(d), .252, .316, .336, .408, .500, .501, .525, .526, .527, .602, .1000, .1020	NA
Hexamethyleneimine	C	S/P	II	4m	PV	Restr	A, C	.236(a), (b), (c), (g), .409, .526	I-C
Hexane (all isomers), see Alkanes(C6-C9).	C	P	III	4m	PV	Restr	A	.409	I-D
Hexene (all isomers)	C	P	III	4m	PV	Restr	A	.409	I-D
Hexyl acetate	B	P	III	4m	PV	Restr	A	.409	I-D
Hydrochloric acid	D	S	III	4m	PV	Restr	A	.252, .526, .527, .554, .557, .933, .1045, .1052	I-B
Hydrogen peroxide solutions (over 8% but not over 60%),	C	S/P	III	B/3	PV	Closed	NSR	.238(a), (c), .355, .409, .440(a)(1)&(2), .500, .933, .1004(a)(2), .1500	NA
Hydrogen peroxide solutions (over 60% but not over 70%),	C	S/P	II	B/3	PV	Closed	NSR	.238(a), (c), .355, .409, .440(a)(1)&(2), .500, .933, .1004(a)(2), .1500	NA
2-Hydroxyethyl acrylate	B	S/P	II	B/3	PV	Closed	A	.408, .525, .526, .912(a)(1), .933, .1002(a), (b), .1004, .1020	NA
N,N-bis(2-Hydroxyethyl) oleamide	B	P	II	4m	PV	Restr	A	.409, .440, .488, .908(a), (b)	NA
2-Hydroxy-4-(methylthio)butanoic acid	C	P	III	NR	Open	Open	A	.440, .903, .908(a)	NA
alpha-hydro-omega-Hydroxytrideca(oxytetra methylene), see Poly(tetramethylene ether) glycols (mw 950-1050).									
l-Isocapropane-2,3-diol/s	B	P	III	NR	Open	Open	A	.409, .440, .908(a)	NA
Isophorone diamine	D	S	III	4m	PV	Restr	A	.236(b), (c), .526	NA

Cargo name	IMO Annex II Pollution Category	Haz.	Cargo containment system	Vent height	Vent	Gauge	Fire protection system	Special requirements in 46 CFR Part 153	Electrical hazard class and group
a.	b.	c.	d.	e.	f.	g.	h.	i.	j.
Isophorone diisocyanate ⁶	B	S/P	II	B/3	PV	Closed	A, B, C ⁶ , D	.236(a), (b), .316, .409, .500, .501, .525, .526, .602, .1000, .1020	NA
Isoprene	C	S/P	III	4m	PV	Restr	B	.372, .409, .440, .912(a)(1), .1002(a), (b), .1004	I-D
<i>Isopropylbenzene</i> , see Propylbenzene (all isomers)									
Lactonitrile solution (80% or less)	B	S/P	II	B/3	PV	Closed	A, C, D	.238(d), .252, .316, .336, .408, .440, .525, .526, .527, .908(a), .912(a)(2), .1002, .1004, .1020, .1035	I-D
Lauric acid	B	P	III	NR	Open	Open	A	.409, .440, .488, .908(a), (b)	NA
Lauryl polyglucose (50% or less), see Alkyl(C12-C14) polyglucoside solution (55% or less).									
Long chain alkaryl polyether (C11-C20) ..	C	P	III	NR	Open	Open	A, B	(.440, .903, .908(a)) ¹	NA
Long chain polyetheramine in alkyl(C2-C4)benzenes.	C	P	III	4m	PV	Restr	A	.409, .440, .903, .908(a)	I-D
Magnesium long chain alkyl salicylate (C11+).	C	P	III	NR	Open	Open	A, B	(.440, .903, .908(a)) ¹	NA
Maleic anhydride ⁷	D	S	III	4m	PV	Restr	A, C	None	I-D
Mercaptobenzothiazol, sodium salt solution, see Sodium-2-mercaptobenzothiazol solution									
Mesityl oxide	D	S	III	4m	PV	Restr	A	.236(b), (c), .409, .526	I-D
Metam sodium solution	A	S/P	II	NR	Open	Open	NSR	.236(a), (b), (c), (g), .409	NA
Methacrylic acid	D	S	III	4m	PV	Restr	A	.238(a), .526, .912(a)(1), .1002(a), .1004	NA
Methacrylic resin in Ethylene dichloride ..	B	S/P	II	4m	PV	Restr	A, B	.236(b), .408, .440, .526, .908(a)	I-D
Methacrylonitrile	D	S	II	B/3	PV	Closed	A	.236(b), .316, .408, .525, .526, .527, .912(a)(1), .1002(a), .1004, .1020	NA
N-(2-Methoxy-1-methyl ethyl)-2-ethyl-6-methyl chloroacetanilide, see Metolachlor									
Methyl acrylate	B	S/P	II	4m	PV	Restr	A, B	.409, .526, .527, .912(a)(1), .1002(a), (b), .1004	I-D
Methylamine solution (42% or less)	C	S/P	II	B/3	PV	Closed	A, C, D	.236(a), (b), (c), (g), .316, .408, .525, .526, .527, .1020	I-D
Methylamyl acetate	C	P	III	4m	PV	Restr	A	.409	I-D
Methylamyl alcohol	C	P	III	4m	PV	Restr	A	.409	I-D
Methyl butyrate	C	P	III	4m	PV	Restr	A	.409	I-D
Methylcyclohexane	C	P	III	4m	PV	Restr	A	.409	I-D
Methylcyclopentadiene dimer	B	P	III	4m	PV	Restr	B	.409	I-B
Methyl diethanolamine	D	S	III	NR	Open	Open	A	.236(b), (c)	I-C
Methylene chloride, see Dichloromethane									
2-Methyl-6-ethylamine	C	S/P	III	NR	Open	Open	A, B, C, D	None	NA
2-Methyl-5-ethylpyridine	B	S/P	III	NR	Open	Open	A, D	.236(b), .409	I-D
Methyl formate	D	S	II	B/3	PV	Restr	A	.372, .408, .440, .525, .526, .527, .1020	I-D

Methyl heptyl ketone	B	S	III	4m	PV	Restr	A, B, C,	.409	I-D
2-Methyl-2-hydroxy-3-butyne	III	S	III	4m	PV	Restr	A, B, C,	.236(b), (d), (f), (g), .409, .526	I-D
Methyl methacrylate	D	S	II	4m	PV	Restr	A, B	.409, .526, .912(a)(1), .1002(a), (b), .1004	I-D
Methyl naphthalene (molten)	A	S/P	II	4m	PV	Restr	A, D	.409	I-D
2-Methyl-1-pentene (Hexene (all isomers)) see Alkanes(C6-C9).									
4-Methyl-1-pentene (Hexene (all isomers)); see Alkanes(C6-C9).									
Methyl tert-pentyl ether, see tert-Amyl methyl ether.									
2-Methylpyridine	D	S	II	B/3	PV	Closed	A, C	.236(b), .408, .525(a) (c), (d), (e), .1020	I-D
3-Methylpyridine	C	S/P	II	B/3	PV	Closed	A, C	.236(b), .408, .525(a), (c), (d), (e), .1020	I-D
4-Methylpyridine	D	S	II	B/3	PV	Closed	A, C, D	.236(b), .408, .440, .525(a), (c), (d), (e), .526, .908(b), .1020.	I-D
Methyl salicylate	B	P	III	NR	Open	Open	A	.409	I-D
alpha-Methylstyrene	A	S/P	III	4m	PV	Restr	A, D	.409, .526, .912(a)(1), .1002(a), (b), .1004	I-D
3-(Methylthio) propionaldehyde	B	S/P	III	B/3	PV	Closed	B, C	.238(e), .316, .408, .525, .526, .527, .1020	NA
Meclochlor	B	P	III	NR	Open	Open	A	.409	NA
Morpholine	D	S	III	4m	PV	Restr	A	.236(b), (c), .409	I-C
Motor fuel anti-knock compounds (containing lead alkyls).	A	S/P	I	B/3	PV	Closed	A, B, C	.252, .316, .336, .408, .525, .526, .527, .933, .1020, .1025.	I-D
Naphthalene (molten)	A	S/P	II	4m	PV	Restr	A, D	.409, .440, .908(b)	I-D
Naphthalene sulfonic acid, sodium salt solution (40% or less).	[A]	P	III	NR	Open	Open	NSR	.409	NA
Naphthene acid	A	P	II	NR	Open	Open	A	.409	NA
Naphthene acid, sodium salt solution	[A]	P	II	NR	Open	Open	NSR	.409	NA
Neodecanoic acid	C	P	III	NR	Open	Open	A	None	NA
Nitric acid (mixture of sulfuric and nitric acids).	C	S/P	II	B/3	PV	Closed	NSR	.316, .408, .526, .527, .554, .555, .556, .559, .602, .933, .1000, .1045.	I-B
Nitric acid (70% or less)	C	S/P	II	4m	PV	Restr	NSR	.408, .526, .527, .554, .555, .559, .933, .1045	I-B
Nitrobenzene	B	S/P	III	B/3	PV	Closed	A, D	.316, .336, .408, .440, .525, .526, .908(b), .933, .1020	I-D
Nitroethane 7	D	S	III	4m	PV	Restr	7A, C	.236(b), .409, .526, .1002(a), (b), .1003	I-C
Nitroethane, 1-Nitropropane (each 15% or more) mixture 7.	D	S	III	4m	PV	Restr	7A	.236(b), .409, .526, .1002	I-C
o-Nitrophenol (molten)	B	S/P	II	B/3	PV	Closed	A, C, D	.409, .440, .525, .526, .908(a), (b), .1020	NA
1- or 2-Nitropropane 7	D	S	III	4m	PV	Restr	7A, C	.409, .526	I-C
Nitropropane (60%), Nitroethane (40%) mixture 7.	D	S	III	4m	PV	Restr	7A, C	.236(b), .409, .526	I-C
Nitropropane (20%), Nitroethane (80%) mixture 7.	D	S	III	4m	PV	Restr	7A, C	.236(b), .409, .526, .1002(a), (b), .1003	I-C
(o-, p-) Nitrotoluene	B	S/P	II	B/3	PV	Closed	A, B	.316, .408, .440, .525, .526, .908(b), .1020	I-D
Nonane (all isomers), see Alkanes(C6-C9).	C	P	III	4m	PV	Restr	B, C	.409	I-D
Nonene (all isomers)	B	P	III	4m	PV	Restr	A	.409	I-D
Nonyl acetate	C	P	III	NR	Open	Open	A	.409	I-D
Nonyl alcohol (all isomers)	C	P	III	NR	Open	Open	A	None	I-D
Nonyl phenol	A	P	II	NR	Open	Open	A	.409	I-D
Nonyl phenol poly(4+)ethoxylates	B	P	III	NR	Open	Open	A	.409, .440, .488 ¹ , .908(a), (b)	I-D

Cargo name	IMO Annex II Pollution Category	Haz.	Cargo containment system	Vent height	Vent	Gauge	Fire protection system	Special requirements in 46 CFR Part 153	Electrical hazard class and group
a.	b.	c.	d.	e.	f.	g.	h.	i.	j.
Noxious liquid, N.F., (1) n.o.s. ("trade name" contains "principal component") ST 1, Cat A.	A	P	I	NR	Open	Open	A	.408	NA
Noxious liquid, F., (2) n.o.s. ("trade name" contains "principal component") ST 1, Cat A.	A	P	I	4m	PV	Restr	A	.408	NA
Noxious liquid, N.F., (3) n.o.s. ("trade name" contains "principal component") ST 2, Cat A.	A	P	II	NR	Open	Open	A	.409	NA
Noxious liquid, F., (4) n.o.s. ("trade name" contains "principal component") ST 2, Cat A.	A	P	II	4m	PV	Restr	A	.409	NA
Noxious liquid, N.F., (5) n.o.s. ("trade name" contains "principal component") ST 2, Cat B.	B	P	II	NR	Open	Open	A	.409; (.440, .908) ¹	NA
Noxious liquid, N.F., (6) n.o.s. ("trade name" contains "principal component") ST 2, Cat B, mp. equal to or greater than 15 deg. C.	B	P	II	NR	Open	Open	A	.409, .440, .488, .908(b); (.908(a)) ¹	NA
Noxious liquid, F., (7) n.o.s. ("trade name" contains "principal component") ST 2, Cat B.	B	P	II	4m	PV	Restr	A	.409; (.440, .908) ¹	NA
Noxious liquid, F., (8) n.o.s. ("trade name" contains "principal component") ST 2, Cat B, mp. equal to or greater than 15 deg. C.	B	P	II	4m	PV	Restr	A	.409, .440, .488, .908(b); (.908(a)) ¹	NA
Noxious liquid, N.F., (9) n.o.s. ("trade name" contains "principal component") ST 3, Cat A.	A	P	III	NR	Open	Open	A	.409	NA
Noxious liquid, F., (10) n.o.s. ("trade name" contains "principal component") ST 3, Cat A.	A	P	III	4m	PV	Restr	A	.409	NA
Noxious liquid, N.F., (11) n.o.s. ("trade name" contains "principal component") ST 3, Cat B.	B	P	III	NR	Open	Open	A	(.409, .440, .908) ¹	NA
Noxious liquid, N.F., (12) n.o.s. ("trade name" contains "principal component") ST 3, Cat B, mp. equal to or greater than 15 deg. C.	B	P	III	NR	Open	Open	A	.409, .440, .488, .908(b); (.908(a)) ¹	NA
Noxious liquid, F., (13) n.o.s. ("trade name" contains "principal component") ST 3, Cat B.	B	P	III	4m	PV	Restr	A	.409; (.440, .908) ¹	NA

Noxious liquid, F., (14) n.o.s. ("trade name" contains "principal component") ST 3, Cat B, mp. equal to or greater than 15 deg. C.	B	P	III	4m	PV	Restr	A	.409, .440, .488, .908(b); (.908(a)) ¹	NA
Noxious liquid, N.F., (15) n.o.s. ("trade name" contains "principal component") ST 3, Cat C.	C	P	III	NR	Open	Open	A	(.440, .903, .908) ¹	NA
Noxious liquid, F., (16) n.o.s. ("trade name" contains "principal component") ST 3, Cat C.	C	P	III	4m	PV	Restr	A	(.440, .903, .908) ¹	NA
Octane (all isomers), see Alkanes(C6-C9)	C	P	III	4m	PV	Restr	A	.409	I-D
Octanol (all isomers)	C	P	III	NR	Open	Open	A	None	I-D
Octene (all isomers)	B	P	III	4m	PV	Restr	A	.409	I-D
Octyl acetate	C	P	III	NR	Open	Open	A	None	I-D
Octyl aldehydes	B	P	III	4m	PV	Restr	A	.409, .440, .908(b)	I-C
Octyl nitrates (all isomers), see Alkyl(C7-C9) nitrates.	C	P	III	4m	PV	Restr	A	.409	I-D
Olefin mixtures (C5-C7)	B	P	III	4m	PV	Restr	A	.409	I-D
Olefin mixtures (C5-C15)	B	P	III	4m	PV	Restr	A	.409, .440, .908(a), (b)	I-D
alpha-Olefins (C6-C18) mixtures	B	P	III	4m	PV	Restr	A	.316, .408, .440, .526, .527, .554, .555, .556, .602, .908(a), .933, .1000, .1045, .1052.	I-B
Oleum	C	S/P	II	B/3	PV	Closed	NSR	.409, .526	NA
Oleylamine	A	S/P	II	4m	PV	Restr	A, B	.440, .903, .908(a), (b)	NA
Palm kernel acid oil	C	P	III	NR	Open	Open	A	.409, .440, .908(b)	NA
Paraldehyde	C	S/P	III	4m	PV	Restr	A	.409, .440, .908(b)	I-C
Paraldehyde-ammonia reaction product	C	S/P	III	4m	PV	Restr	A	.236(a), (b), (c), (g), .525(a), (c), (e), .408, .526, .1020	NA
Pentachloroethane	B	S/P	II	B/3	PV	Closed	NSR	.316, .409, .525, .526, .1020	NA
1,3-Pentadiene	C	S/P	III	4m	PV	Restr	A, B	.409, .526, .912(a)(1), .1002, .1004	I-D
Pentane (all isomers)	C	P	III	4m	PV	Restr	A, B	.372, .409	I-D
n-Pentanoic acid (64%), 2-Methyl butyric acid (36%) mixture.	D	S	II	B/3	Open	Closed	A, D	.238(a), .408, .525(a), (c), (e), .554, .933, .1020	I-D
Pentene (all isomers)	C	P	III	4m	PV	Restr	A	.409	I-D
n-Pentyl propionate	B	P	III	4m	PV	Restr	A	.409	I-D
Perchloroethylene	B	S/P	III	B/3	PV	Restr	NSR	.409, .526	NA
Phenol (or solutions with 5% or more Phenol).	C	S/P	II	B/3	PV	Closed	A	.408, .440, .488, .525, .526, .908(a), (b), .933, .1020	I-D
1-Phenyl-1-xylyl ethane	C	P	III	NR	Open	Open	A, B	None	NA
Phosphate esters, alkyl(C12-C14)amine	B	P	III	4m	PV	Restr	A	.409	NA
Phosphoric acid	D	S	III	NR	Open	Open	NSR	.554, .555, .558, .1045, .1052, .933	I-B
Phthalic anhydride (molten)	C	S/P	III	4m	PV	Restr	A, D	.440, .908(a), (b)	I-D
Pinene, see the alpha- or beta- isomers.	A	P	III	4m	PV	Restr	A	.409	I-D
alpha-Pinene	B	P	III	4m	PV	Restr	A	.409	I-D
beta-Pinene	C	P	III	NR	Open	Open	A	.440, .908(a)	I-D
Pine oil	C	P	III	4m	PV	Restr	A	.409, .440, .903, .908(a)	NA
Polyalkyl(C18-C22) acrylate in Xylene	C	P	III	NR	Open	Open	A	.440, .903, .908(a)	NA
Polyalkylene oxide polyol	A	P	II	4m	PV	Restr	A, D	.409	I-D
Poly(2-), cyclic aromatics	A	P	III	4m	PV	Restr	A	.236(b), (c), .400, .440, .908(b)	I-D
Polyethylene polyamines	C	S/P	III	NR	Open	Open	A	.238(d)	NA
Polyferric sulfate solution	C	S/P	III	NR	Open	Open	NSR		NA

Cargo name	IMO Annex II Pollution Category	Haz.	Cargo containment system	Vent height	Vent	Gauge	Fire protection system	Special requirements in 46 CFR Part 153	Electrical hazard class and group
a.	b.	c.	d.	e.	f.	g.	h.	i.	j.
Polyisobutene in aliphatic (C10-C14) solvent.	C	P	III	NR	Open	Open	A	.903	NA
Polymethylene polyphenyl isocyanate ⁶ ...	D	S	II	B/3	PV	Closed	A, C ⁶ , D	.236(a), (b), .409, .500, .501, .525, .526, .602, .1000, .1020.	NA
Polyolefinamine (C28-C250)	C	P	III	NR	Open	Open	A	None	NA
Polyolefinamine in alkyl(C2-C4)benzenes	C	P	III	4m	PV	Restr	A	.409, .440, .903, .908(a)	I-D
Polyolefin phosphorothioate, barium derivative (C28-C250).	C	P	III	NR	Open	Open	A, B	(.440, .903, .908(a)) ¹	NA
Poly(tetramethylene ether) glycols (mw 950-1050).	B	P	III	NR	Open	Open	A, D	.409, .440, .488, .908(a), (b)	NA
Potassium hydroxide solution, see Caustic potash solution	C	P	III	NR	Open	Open	A	.409	NA
Potassium oleate	C	P	III	NR	Open	Open	NSR	None	NA
Potassium thiosulfate (50% or less)	C	P	III	NR	Open	Open	A	.236(b), (c), .440, .526, .903, .908(b)	I-D
iso-Propanolamine	C	S/P	III	NR	Open	Open	A, D	.236(b), (c), .440, .526, .908(b)	NA
n-Propanolamine	C	S/P	III	4m	PV	Restr	A	.316, .409, .526, .527	I-C
Propionaldehyde	D	S	III	4m	PV	Restr	A	.236(a), .409, .527, .554, .933	I-D
Propionic acid	D	S	III	4m	PV	Restr	A	.238(a), .526	I-D
Propionic anhydride	C	S/P	III	B/3	PV	Closed	A, D	.252, .316, .336, .408, .525, .526, .527, .1020	I-D
Propionitrile	C	S/P	II	B/3	PV	Closed	C, D	.236(b), (c), .372, .408, .440, .525, .526, .527, .1020	I-D
iso-Propylamine	C	S/P	II	B/3	PV	Closed	C, D	.236(a), (b), (c), (g), .408, .440, .525, .526, .527, .1020	I-D
iso-Propylamine solution (70% or less)	C	S/P	II	B/3	PV	Closed	A, C, D	.236(b), (c), .408, .500, .525, .526, .527, .1020	I-D
n-Propylamine, see Propylbenzene (all isomers).	A	P	III	4m	PV	Restr	A	.409	I-D
Propylbenzene (all isomers)	D	S	III	4m	PV	Restr	A, B	.409	I-D
n-Propyl chloride	C	P	III	4m	PV	Restr	A	.409, .440, .903, .908(a)	I-D
iso-Propylcyclohexane	C	P	III	4m	PV	Restr	A	.409	NA
Propylene dimer	C	P	III	4m	PV	Restr	A	.372, .408, .440, .500, .526, .530, .1010, .1011	I-B
Propylene oxide	B	S/P	II	B/3	PV	Closed	A, C	.409	I-D
Propylene tetramer	B	P	III	4m	PV	Restr	A	.409	I-D
Propylene trimer	D	S	III	4m	PV	Restr	A	.409, .500, .515, .912(a)(1)	I-D
iso-Propyl ether	D	S	III	4m	PV	Restr	A	.236(b), .409	I-D
Pyridine	D	S	III	4m	PV	Restr	A	.409, .440, .488, .908(a), (b)	I-D
Rosin, see Rosin oil.	B	P	III	NR	Open	Open	A	.409	NA
Rosin oil	B	P	III	NR	Open	Open	A		NA
Rosin soap (disproportionated) solution									
Sodium alkyl (C14-C17) sulfonates 60-65% solution, see Alkane (C14-C17) sulfonic acid, sodium salt solution.									
Sodium aluminate solution	D	S	III	NR	Open	Open	NSR	.236(a), (b), (c), (g), .933	NA

Sodium borohydride (15% or less), Sodium hydroxide solution.	C	S/P	III	NR	Open	Open	NSR	.236(a), (b), (c), (g), .440, .908(a), .933	NA
Sodium chlorate solution (50% or less)	III	S	III	NR	Open	Open	NSR	.409, .933, .1065	NA
Sodium dichromate solution (70% or less)	C	S/P	II	B/3	Open	Closed	NSR	.236(b), (c), .408, .525, .933, .1020	NA
Sodium dimethyl naphthalene sulfonate solution, see Dimethyl naphthalene sulfonic acid, sodium salt solution.	B	P	III	NR	Open	Open	NSR	.409	NA
Sodium hydrogen sulfide (6% or less), Sodium carbonate (3% or less) solution.	D	S	III	NR	Open	Open	NSR	None	NA
Sodium hydrogen sulfite solution (45% or less).	B	S/P	III	4m	PV	Restr	NSR	.409, .440, .526, .908(b), .933	NA
Sodium hydrosulfide solution (45% or less).	B	S/P	III	4m	PV	Closed	A, C	.236(a), (b), (c), (g), .316, .372, .408, .525, .526, .527, .933, .1002, .1020.	NA
Sodium hydrosulfide, Ammonium sulfide solution.	C	S/P	III	4m	PV	Restr	NSR	.236(a), (b), .933	NA
Sodium hydroxide solution, see Caustic soda solution	[C]	P	III	NR	Open	Open	A	(.440, .903, .908(a)) ¹	NA
Sodium hypochlorite solution (15% or less).	B	S/P	III	NR	Open	Open	NSR	.236(a), (b), (c), (g), .409, .440, .908(b), .933	NA
Sodium long chain alkyl salicylate (C13+)									
Sodium-2-mercaptobenzothiazol solution.									
Sodium N-methylthiocarbamate solution, see Metam sodium solution.									
Sodium naphthalene sulfonate solution (40% or less), see Naphthalene sulfonic acid, sodium salt solution (40% or less).	B	S/P	II	NR	Open	Open	NSR	.408, .525(a), (c), (d), (e), .1020	NA
Sodium naphthenate solution, see Naphthenic acid, sodium salt solution.	B	S/P	II	NR	Open	Open	A	.409, .440, .908(e)	NA
Sodium nitrite solution	C	P	III	NR	Open	Open	A	None	NA
Sodium petroleum sulfonate	B	P	III	B/3	PV	Closed	NSR	.236(a), (b), .409, .440, .526, .908(b)	NA
Sodium silicate solution	C	P	III	NR	Open	Open	NSR	.409, .440, .908(b)	NA
Sodium sulfide solution (15% or less)	D	S	III	NR	Open	Open	A, B	.238(e)	NA
Sodium sulfite solution (25% or less)									
Sodium tarrates, Sodium succinates solution.									
Sodium thiocyanate solution (56% or less)	B	P	III	NR	Open	Open	NSR	.238(a), .409	NA
Styrene monomer	B	S/P	III	4m	PV	Restr	A, B	.236(b), .409, .912(a)(1), .1002(a), (b), .1004	I-D
Sulfohydrocarbon, long chain (C18+) alkylamine mixture.	B	P	III	NR	Open	Open	A, B	.409; (.440, .908(a)) ¹	NA
Sulfur (molten)	III	S	III	NR	Open	Open	NSR	.252, .440, .526, .545	I-C
Sulfuric acid	C	S/P	III	NR	Open	Open	NSR	.440, .554, .555, .556, .602, .908(a), (b), .933, .1000, .1045, .1046, .1052.	I-B
Tall oil (crude and distilled)	B	P	III	NR	Open	Open	A	.409, .440, .488, .908(a), (b)	NA
Tall oil, fatty acid (resin acids less than 20%)	C	P	III	NR	Open	Open	A	.440, .908(a), (b)	NA
Tall oil fatty acid, barium salt	B	S/P	III	NR	Open	Open	A	.409, .440, .908(e)	NA
Tall oil soap (disproportionated) solution	B	P	III	NR	Open	Open	A	.409, .440, .908(a), (b)	NA
1,1,2,2-Tetrachloroethane	B	P	III	B/3	PV	Restr	NSR	.316, .409, .525, .526, .1020	NA
Tetraethylenepentamine ³	D	S	III	NR	Open	Open	A	.236(b), (c), (g)	I-C
Tetrahydrofuran	D	S	III	4m	PV	Restr	A, D	.409, .526, .912(a)(2), .1004	I-C

Cargo name	IMO Annex II Pollution Category	Haz.	Cargo containment system	Vent height	Vent	Gauge	Fire protection system	Special requirements in 46 CFR Part 153	Electrical hazard class and group
a.	b.	c.	d.	e.	f.	g.	h.	i.	j.
Tetrahydrophthalene	C	P	III	NR	Open	Open	A	None	I-D
Tetramethylbenzene (all isomers)	A	P	III	NR	Open	Open	A	None	I-D
Toluene	C	P	III	4m	PV	Open	A	.409	I-D
Toluenediamine	C	S/P	II	B/3	PV	Closed	A, B, C, D	.236(a), (b), (c), (g), .316, .408, .440, .525, .526, .527, .908(a), (b), .933, .1020	NA
Toluene diisocyanate ⁶	C	S/P	II	4m	PV	Closed	A, C ⁶ , D	.236(b), .316, .408, .440, .500, .501, .525, .526, .527, .602, .908(b), .1000, .1020	I-D
o-Toluidine	C	S/P	II	B/3	PV	Closed	A, C	.316, .408, .525, .526, .933, .1020	I-D
Tributyl phosphate	B	P	III	NR	Open	Open	A	.409	I-D
1,2,3-Trichlorobenzene (molten)	A	S/P	I	B/3	PV	Closed	A, C, D	.316, .408, .440, .526, .908(b), .933	I-D
1,2,4-Trichlorobenzene	B	S/P	III	4m	PV	Closed	A, B, C	.409, .440, .526, .908(b)	I-D
1,1,1-Trichloroethane	C	P	III	NR	Open	Open	A	.409	I-D
1,1,2-Trichloroethane	C	S/P	III	B/3	PV	Restr	NSR	.409, .525, .526, .933, .1020	I-D
Trichloroethylene	C	S/P	III	B/3	PV	Restr	NSR	.316, .409, .525, .526, .1020	I-D
1,2,3-Trichloropropane	C	S/P	II	B/3	PV	Closed	A, B, C, D	.316, .408, .525, .526, .933, .1020	I-D
1,1,2-Trichloro-1,2,2-trifluoroethane	C	P	III	NR	Open	Open	NSR	None	NA
Tricresyl phosphate (less than 1% of the ortho isomer)	A	P	II	NR	Open	Open	A	.409	NA
Tricresyl phosphate (1% or more of the ortho isomer)	A	S/P	I	4m	PV	Closed	A, B	.408, .525(a), (c), (d), (e), .1020	I-D
Tridecanoic acid	B	P	III	NR	Open	Open	A	.409, .440, .488, .908(a), (b)	NA
Triethanolamine	D	S	III	B/3	PV	Open	A	.236(a), (b), (c), (g)	I-C
Triethylamine	C	S/P	II	B/3	PV	Restr	A, B, C	.236(b), (c), .409, .525, .526, .527, .1020	I-C
Triethylbenzene	A	P	II	NR	Open	Open	A	.409	I-D
Triethylene glycol di-(2-ethylbutyrate)	[C]	P	III	NR	Open	Open	A	None	I-C
Triethylenetetramine	D	S	III	NR	Open	Open	A	.236(a), (d), (c)	I-C
Triethyl phosphate	B	S/P	III	B/3	PV	Restr	A, B, D	.409, .526	NA
Triisopropylated phenyl phosphates	A	P	II	NR	Open	Open	A	.409	NA
Trimethylacetic acid	D	S	III	4m	PV	Restr	A, C	.238(a), .266, .554	I-D
Trimethylamine solution (30% or less)	C	S/P	II	B/3	PV	Closed	A, C	.236(a), (b), (c), (g), .372, .408, .440, .525, .526, .527, .908(b), .1020	I-C
Trimethylbenzene (all isomers)	A	P	III	4m	PV	Restr	A	.409	I-D
Trimethylhexamethylenediamine (2,2,4- and 2,4,4- isomers)	D	S	III	NR	Open	Open	A, C	.236(a), (b), (c), (g), .409	NA
Trimethylhexamethylene diisocyanate (2,2,4- and 2,4,4- isomers) ⁶	B	S/P	II	B/3	PV	Closed	A, C ⁶	.316, .409, .500, .501, .525, .526, .602, .1000, .1020 ...	NA
2,2,4-Trimethyl-1,3-pentanediol-1-iso-butylate	C	P	III	NR	Open	Open	A	None	I-D
Trimethyl phosphite	#	S	III	4m	PV	Restr	A, D	.409, .526, .602, .1000	I-D
1,3,5-Trioxane	D	S	III	4m	PV	Restr	A, D	.409	I-C
Trixylenyl phosphate	A	P	I	NR	Open	Open	A	.408	NA

Trixylyl phosphate, see Trixylyl phosphate												
Trixylyl phosphate, see Trixylyl phosphate	B	P	III	4m	PV	Restr	A	.409	I-D			
Turpentine	B	P	III	NR	Open	Open	A	.440, .908(a), (b)	NA			
Undecanoic acid	B	P	III	NR	Open	Open	A	.409	I-D			
1-Undecene	B	P	III	NR	Open	Open	A	.409, .440, .908(t)	I-D			
1-Undecyl alcohol	B	P	III	NR	Open	Open	A	.236(b), .526	I-D			
Urea, Ammonium nitrate solution (containing more than 2% NH ₃)	C	S/P	III	4m	PV	Restr	A	.409, .500, .526	I-C			
Valeraldehyde (all isomers)	C	S/P	III	4m	PV	Restr	A	.409, .912(a)(1), .1002(a), (b), .1004	I-D			
Vinyl acetate	C	S/P	III	4m	PV	Restr	A	.236(b), (d), (f), (g), .252, .372, .408, .440, .500, .515, .526, .527, .912(a)(1), .1002(a), (b), .1004	I-C			
Vinyl ethyl ether	C	S/P	II	4m	PV	Closed	A	.236(a), (b), .372, .409, .440, .500, .526, .527, .912(a)(1), .1002(a), (b), .1004	I-D			
Vinylidene chloride	D	S	II	4m	PV	Restr	B	.409, .912(a)(1), .1002(a), (b), .1004	NA			
Vinyl neodecanate	B	S/P	III	NR	Open	Open	A, B	.409, .912(a)(1), .1002(a), (b), .1004	I-D			
Vinyltoluene	A	S/P	III	4m	PV	Restr	A, B, D	.236(a), (b), (c), (g), .409, .912(a)(1), .1002(a), (b), .1004	I-D			
White spirit (low (15-20%) aromatic)	B	P	II	4m	PV	Restr	A	.409	NA			
Xylenes ^a (ortho-, meta-, para-)	C	P	III	4m	PV	Restr	A	.409, .440, .908(b) ⁸	I-D			
Xylenes, Ethylbenzene (10% or more) mixture.	B	P	III	4m	PV	Restr	A	.409	NA			
Xylenol	B	S/P	III	NR	Open	Open	A, B	.409, .440, .908(a), (b)	NA			
Zinc alkyl dithiophosphate (C7-C16)	C	P	III	NR	Open	Open	A, B	(.440, .903, .908(a)) ¹	NA			
Zinc alkyl dithiophosphate (C3-C14)	B	P	III	NR	Open	Open	A, B	.409; (.440, .908(a)) ¹	NA			

Column Heading Footnotes:
a. The cargo name must be as it appears in this column (see 153.900, 153.907). Words in italics are not part of the cargo name but may be used in addition to the cargo name. When one entry references another entry by use of the word "see", and both names are in roman type, either name may be used as the cargo name (e.g., Diethyl ether, see Ethyl ether). However, the referenced entry is preferred.
b. The provisions contained in 46 CFR part 197, subpart C, apply to liquid cargoes containing 0.5% or more benzene by volume.
c. This column lists the IMO Annex II Pollution Category.
d. A, B, C, D—NLS Category of Annex II of MARPOL 73/78.
e. Appendix III of Annex II (non-NLS cargoes) of MARPOL 73/78.
f. No determination of NLS status. For shipping on an oceangoing vessel, see 46 CFR 153.900(c).
g. A NLS category in brackets indicates that the product is provisionally categorized and that further data are necessary to complete the evaluation of its pollution hazards. Until the hazard evaluation is completed, the pollution category assigned is used.
h. The NLS category has been assigned by the U.S. Coast Guard, in absence of one assigned by the IMO. The category is based upon a GESAMP Hazard Profile or by analogy to a closely related product having an NLS assigned.
i. This column lists the hazard(s) of the commodity.
j. The commodity is included because of its safety hazards.
k. The commodity is included because of its pollution hazards.
l. The commodity is included because of both its safety and pollution hazards.
m. This column lists the type of containment system the cargo must have (see 153.230 through 153.232).
n. This column lists the height of any vent riser required (see 153.350 and 153.351).
o. This column lists any vent control valve required (see 153.355).
p. This column lists the type of gauging system required (see 153.400 through 153.406).
q. This column lists the type of fire protection system required. Where more than one system is listed, any listed system may be used. A dry chemical system may not be substituted for either type of foam system unless the dry chemical system is listed as an alternative or the substitution is approved by Commandant (G-MSO) (see 153.460). The types are as follows:
A is a foam system for water soluble cargoes (polar solvent foam).
B is a foam system for water insoluble cargoes (non-polar solvent foam).
C is a water spray system.
D is a dry chemical system.
NSR means there is no special requirement applying to fire protection systems.
i. This column lists sections that apply to the cargo in addition to the general requirements of this part. The 153 Part number is omitted.

i. This column lists the electrical hazard class and group used for the cargo when determining requirements for electrical equipment under Subchapter J (Electrical Engineering) of this chapter.

A number of electrical hazard class and group assignments are based upon that which appears in "Classification of Gases, Liquids and Volatile Solids Relative to Explosion-Proof Electrical Equipment", Publication NMAB 353–5, National Academy Press, 1982, when not appearing in NFPA 497M, "Manual for Classification of Gases, Vapors and Dusts for Electrical Equipment in Hazardous (Classified) Locations."

The I-B electrical hazard does not apply to weather deck locations (see 46 CFR Part 111) for inorganic acids: Chlorosulfonic acid; Hydrochloric acid; Nitrolic acid; Nitric acid (70% or less); Oleum; Phosphoric acid; Sulfuric acid.

Abbreviations used in the Table:

NR—No requirement.

NA—Not applicable.

Abbreviations for Noxious Liquid cargoes:

N.F.—non-flammable (flash point greater than 60 deg C (140 deg F), closed cup (cc)).

F.—flammable (flash point less than or equal to 60 deg C (140 deg F), closed cup (cc)).

n.o.s.—not otherwise specified.

ST—Ship type.

Cat—Pollution category.

Footnotes for Specific Cargoes:

1. Special applicability:

153.440 and .908(a) apply to the chemical, and mixtures containing the chemical, with a viscosity of 25 mPa.s at 20 deg C (68 deg F).

153.440 and .908(b) apply to the chemical, and mixtures containing the chemical, with a melting point of 0 deg C (32 deg F) and above.

153.488 applies to the chemical, and mixtures containing the chemical, with a melting point of 15 deg C (59 deg F) and above.

2. Benzene containing cargoes.

Applies to mixtures containing no other components with safety hazards and where the pollution category is C or less.

3. Diammonium salt of Zinc ethylenediaminetetraacetic acid solution; Tetraethylenepentamine.

Aluminum is a questionable material of construction with this cargo since pitting and corrosion has been reported. The IMO Chemical Code prohibits aluminum as a material of construction for this cargo.

4. 2,4-Dichlorophenol.

Some tank pitting has been reported when this cargo is contaminated with water, including moisture in the air. The IMO Chemical Code requires that the vapor space over this cargo be kept dry.

5. Reserved.

6. Diphenylmethane diisocyanate; Hexamethylene diisocyanate; Isophorone diisocyanate; Polymethylene polyphenyl isocyanate; Toluene diisocyanate; Trimethylhexamethylene diisocyanate (2,2,4- and 2,4,4- isomers).

Water is effective in extinguishing open air fires but will generate hazardous quantities of gas if put on the cargo in enclosed spaces.

7. Maleic anhydride; Nitroethane; Nitroethane, 1-Nitropropane mixtures; 1- or 2-Nitropropane; Nitroethane, Nitroethane mixtures.

Dry chemical extinguishers should not be used on fires involving these cargoes since some dry chemicals may react with the cargo and cause an explosion.

8. Xylenes.

Special requirement .908(b) only applies to the para- (p-) isomer, and mixtures containing the para-isomer having a melting point of 0 deg C (32 deg F) or more.

[USCG 2000–7079, 65 FR 67196, Nov. 8, 2000]

TABLE 2 TO PART 153—CARGOES NOT REGULATED UNDER SUBCHAPTERS D OR O OF THIS CHAPTER WHEN CARRIED IN BULK ON NON-OCEANGOING BARGES

The cargoes listed in this table are not regulated under subchapter D or O of this title when carried in bulk on non-oceangoing barges. Category A, B, or C noxious liquid substance (NLS) cargo, as defined in § 153.2 of this chapter, listed in this table, or any mixture containing one or more of these cargoes, must be carried under this subchapter if carried in bulk on an oceangoing ship. Requirements for Category D NLS cargoes and mixtures of non-NLS cargoes with Category D NLS cargoes are in 33 CFR part 151.

Cargoes	Pollution Category
2-Amino-2-hydroxymethyl-1,3-propanediol solution	III
Ammonium hydrogen phosphate solution	D
Ammonium lignosulfonate solution, <i>see also</i> Lignin liquor	III
Ammonium nitrate solution (45% or less)	D
Ammonium nitrate, Urea solution (2% or less NH ₃), <i>see also</i> Urea, Ammonium nitrate solution (2% or less NH ₃)	D
Ammonium phosphate, Urea solution, <i>see also</i> Urea, Ammonium phosphate solution	D
Ammonium polyphosphate solution	D
Ammonium sulfate solution (20% or less)	D
Ammonium thiosulfate solution (60% or less)	C
Apple juice	III
Calcium bromide solution	III
Calcium carbonate slurry	III
Calcium chloride solution	III
Calcium hydroxide slurry	D
Calcium lignosulfonate solution, <i>see also</i> Lignin liquor	III
Calcium nitrate, Magnesium nitrate, Potassium chloride solution	III
Caramel solutions	III
Chlorinated paraffins (C14–C17) (with 52% Chlorine)	III
2-Chloro-4-ethylamino-6-isopropylamino-5-triazine solution	#
Choline chloride solution	D
Clay slurry	III
Coal slurry	III
<i>Dextrose</i> solution, <i>see</i> Glucose solution	
Diethylenetriamine pentaacetic acid, pentasodium salt solution	III
1,4-Dihydro-9,10-dihydroxy anthracene, disodium salt solution	D
Dodeceny succinic acid, dipotassium salt solution	D
Drilling brine (containing Calcium, Potassium, or Sodium salts) (<i>see also</i> Potassium chloride solution (10% or more))	III
Drilling brine (containing Zinc salts)	B
Drilling mud (low toxicity) (<i>if non-flammable and non-combustible</i>)	[III]
Ethylenediaminetetraacetic acid, tetrasodium salt solution	D
Ethylene-Vinyl acetate copolymer (<i>emulsion</i>)	III
Ferric hydroxyethylethylenediamine triacetic acid, trisodium salt solution	D
Fish solubles (<i>water based fish meal extracts</i>)	III
Fructose solution	#
Glucose solution	III

Cargoes	Pollution Category
Glycine, sodium salt solution	III
Hexamethylenediamine adipate solution	D
N-(Hydroxyethyl)ethylenediamine triacetic acid, trisodium salt solution	D
Kaolin clay solution	III
Kaolin slurry	III
Kraft pulping liquor (free alkali content, 1% or less) <i>including: Black, Green, or White liquor</i>	#
Lignin liquor (free alkali content, 1% or less) <i>including:</i>	#
Ammonium lignosulfonate solution	III
Calcium lignosulfonate solution	III
Sodium lignosulfonate solution	III
Lignin sulfonic acid, sodium salt solution, <i>see also</i> Lignin liquor or Sodium lignosulfonate solution	III
Magnesium chloride solution	III
Magnesium hydroxide slurry	III
Milk	III
Molasses	III
Molasses residue (<i>from fermentation</i>)	[III]
Naphthenic acid, sodium salt solution	[A]
Noxious liquid, N.F., (1) n.o.s. ("trade name" contains "principle components") ST 1, Cat A (<i>if non-flammable or non-combustible</i>)	A
Noxious liquid, N.F., (3) n.o.s. ("trade name" contains "principle components") ST 2, Cat A (<i>if non-flammable or non-combustible</i>)	A
Noxious liquid, N.F., (5) n.o.s. ("trade name" contains "principle components") ST 2, Cat B (<i>if non-flammable or non-combustible</i>)	B
Noxious liquid, N.F., (6) n.o.s. ("trade name" contains "principle components") ST 2, Cat B, mp. equal to or greater than 15 deg. C (<i>if non-flammable or non-combustible</i>)	B
Noxious liquid, N.F., (9) n.o.s. ("trade name" contains "principle components") ST 3, Cat A (<i>if non-flammable or non-combustible</i>)	A
Noxious liquid, N.F., (11) n.o.s. ("trade name" contains "principle components") ST 3, Cat B (<i>if non-flammable or non-combustible</i>)	B
Noxious liquid, N.F., (12) n.o.s. ("trade name" contains "principle components") ST 3, Cat B, mp. equal to or greater than 15 deg. C (<i>if non-flammable or non-combustible</i>)	B
Noxious liquid, N.F., (15) n.o.s. ("trade name" contains "principle components") ST 3, Cat C (<i>if non-flammable or non-combustible</i>)	C
Noxious liquid, n.o.s. (17) ("trade name," contains "principal components"), Category D (<i>if non-flammable or non-combustible</i>)	D
Non-noxious liquid, n.o.s. (18) ("trade name," contains "principal components"), Appendix III (<i>if non-flammable or non-combustible</i>)	III
<i>Pentasodium salt of Diethylenetriamine pentaacetic acid</i> solution, <i>see</i> Diethylenetriamine pentaacetic acid, pentasodium salt solution.	
Polyaluminum chloride solution	III
Potassium chloride solution (10% or more)(<i>see also the drilling brines entry</i>)	III
Sewage sludge, treated (<i>treated so as to pose no additional decompositional and fire hazard; stable, non-corrosive, non-toxic, non-flammable</i>)	#
Silica slurry	[III]
Sludge, treated (<i>treated so as to pose no additional decompositional and fire hazard; stable, non-corrosive, non-toxic, non-flammable</i>)	#
Sodium acetate, Glycol, Water mixture (containing 1% or less, Sodium hydroxide) (<i>if non-flammable or non-combustible</i>)	#
Sodium aluminosilicate slurry	III
Sodium carbonate solution	D

Cargoes	Pollution Category
Sodium lignosulfonate solution, <i>see also</i> Lignin liquor	III
<i>Sodium naphthenate solution (free alkali content, 3% or less), see</i> Naphthenic acid, sodium salt solution.	
Sodium poly(4+)acrylate solution	III
Sodium silicate solution	C
Sodium sulfate solution	III
Sorbitol solution	III
Sulfonated polyacrylate solution	III
<i>Tetrasodium salt of Ethylenediaminetetraacetic acid solution, see</i> Ethylenediaminetetraacetic acid, tetrasodium salt solution	
Titanium dioxide slurry	III
1,1,1-Trichloroethane	C
1,1,2-Trichloro-1,2,2-trifluoroethane	C
<i>Trisodium salt of N-(Hydroxyethyl)ethylenediamine triacetic acid solution, see</i> N-(Hydroxyethyl)ethylenediamine triacetic acid, trisodium salt solution.	
Urea, Ammonium mono- and di-hydrogen phosphate, Potassium chloride solution	D
Urea, Ammonium nitrate solution (2% or less NH ₃), <i>see also</i> Ammonium nitrate, Urea solution (2% or less)	D
Urea, Ammonium phosphate solution, <i>see also</i> Ammonium phosphate, Urea solution	D
Urea solution	III
Vanillin black liquor (free alkali content, 1% or less)	#
Vegetable protein solution (<i>hydrolysed</i>)	III
Water	III
<i>Zinc bromide, Calcium bromide solution, see</i> Drilling brine (containing Zinc salts).	

Explanation of Symbols: As used in this table, the following stand for:

A, B, C, D—NLS Category of Annex II of MARPOL 73/78.
 I—Considered an "oil" under Annex I of MARPOL 73/78.
 III—Appendix III of Annex II (non-NLS cargoes) of MARPOL 73/78.

LFG—Liquefied flammable gas.
 #—No determination of NLS status. For shipping on an oceangoing vessel, *see* 46 CFR 153.900(c).

[—A NLS category in brackets indicates that the product is provisionally categorized and that further data are necessary to complete the evaluation of its pollution hazards. Until the hazard evaluation is completed, the pollution category assigned is used.

@The NLS category has been assigned by the U.S. Coast Guard, in absence of one assigned by the IMO. The category is based upon a GESAMP Hazard Profile or by analogy to a closely related product having an NLS assigned.

Abbreviations for Noxious liquid Cargoes:
 N.F.—non-flammable (flash point greater than 60 degrees C (140 degrees F) cc).
 n.o.s.—not otherwise specified.
 ST—Ship type.
 Cat—Pollution category.

[CGD 88–100, 54 FR 43584, Oct. 26, 1989; CGD 92–100, 59 FR 17044, Apr. 11, 1994, as amended by CGD 94–900, 59 FR 45142, Aug. 31, 1994; CGD 94–902, 60 FR 34043, June 29, 1995; CGD 95–900, 60 FR 34052, June 29, 1995; USCG 2000–7079, 65 FR 67213, Nov. 8, 2000]

APPENDIX I TO PART 153 [RESERVED]

APPENDIX II TO PART 153—METRIC UNITS USED IN PART 153

Parameter	Metric (SI unit)	Abbreviation	Equivalent to English or common metric
Force	Newton	N	0.225 lbs.
Length	Meter	m	39.37 in.
	Centimeter	cm3937 in.
Pressure	Pascal	Pa	1.450×10 ⁻⁴ lbs/in. ² .
	Kilo-Pascal (1,000 Pascals).	kPa	0.145 lbs/in. ² .
	Kilo-Pascal	kPa	1.02×10 ⁻² kg/cm ² .
Temperaturedo	kPa	1×10 ³ N/m ² .
	Degree Celsius	°C	5/9 (°F-32).
Viscosity	milli-Pascal second.	mPa.	1.0 centipoise.
do	sec.	
Volume	Cubic meter	m ³	264 gallons (gal).
do	m ³	35.3 ft ³ .

[CGD 73–96, 42 FR 49027, Sept. 26, 1977, as amended by CGD 78–128, 47 FR 21212, May 17, 1982; CGD 81–101, 52 FR 7799, Mar. 12, 1987. Re-designated by CGD 92–100, 59 FR 17045, Apr. 11, 1994]

PART 154—SAFETY STANDARDS FOR SELF-PROPELLED VESSELS CARRYING BULK LIQUEFIED GASES

Subpart A—General

- Sec.
- 154.1 Incorporation by reference.
 - 154.3 Purpose.
 - 154.5 Applicability.
 - 154.7 Definitions, acronyms, and terms.
 - 154.9 Issuance of documents.
 - 154.12 Existing gas vessel: Endorsements and requirements.
 - 154.15 U.S. flag vessel: Endorsement application.
 - 154.17 U.S. flag vessel: Certificate of Inspection endorsement.
 - 154.19 U.S. flag vessel: IMO certificate issuance.
 - 154.22 Foreign flag vessel: Certificate of Compliance endorsement application.
 - 154.24 Foreign flag vessel: IMO Certificate.
 - 154.30 Liquefied gases not included in table 4.
 - 154.32 Equivalents.
 - 154.34 Special approval: Requests.
 - 154.36 Correspondence and vessel information: Submission.
 - 154.40 Right of appeal.